Gas Journal

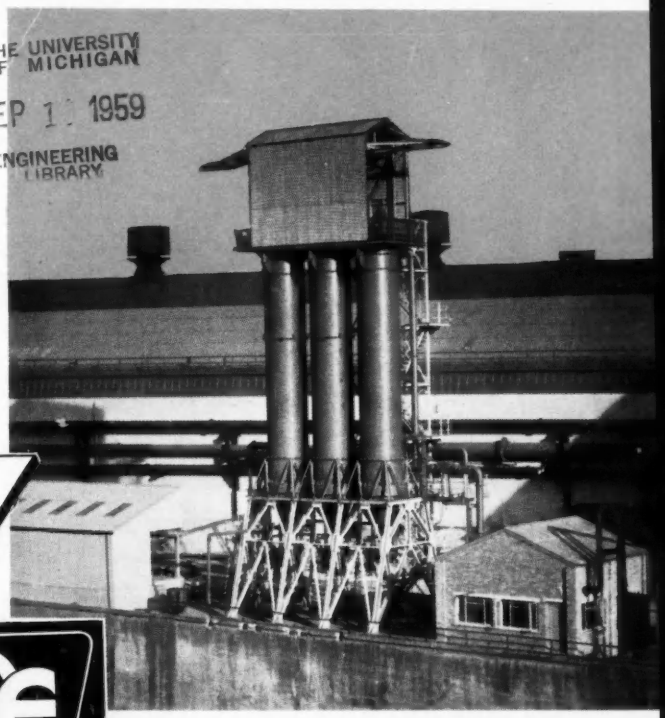
VOL. 299 111th YEAR LONDON, AUGUST 19, 1959 No 5007 PRICE 1/6

THE UNIVERSITY OF MICHIGAN
SEP 1 1959
ENGINEERING LIBRARY

2

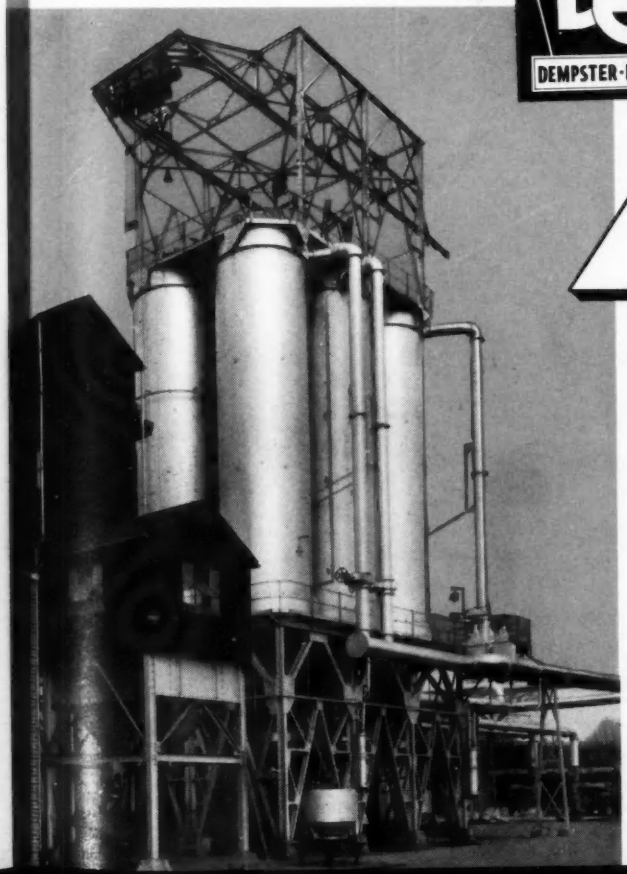
RECENT CONTRACTS

for GASTECHNIK PURIFIERS



RICHARD THOMAS & BALDWINS LTD., EBBW VALE.

DE
DEMPSTER-ELLAND



SOUTH WESTERN GAS BOARD, STAPLETON ROAD WORKS, BRISTOL.

by

ROBERT DEMPSTER AND SONS LTD., ELLAND, YORKS.

Other plants in hand for: NORTH EASTERN GAS BOARD, SOUTHERN GAS BOARD, WALES GAS BOARD, IMPERIAL CHEMICAL INDUSTRIES LTD. (BILLINGHAM DIVISION), HUMPHREYS & GLASGOW LTD., Etc.

measured breathing.....

Into space? It's breath-taking! In high altitude flying, modern breathing apparatus must be dependable as an essential factor of existence.

Down on the ground—and down to earth—D. & G. L. Diaphragms are just as dependable and it is a fact that many of our diaphragms that started work in gas meters years ago are still giving accurate and efficient service today.

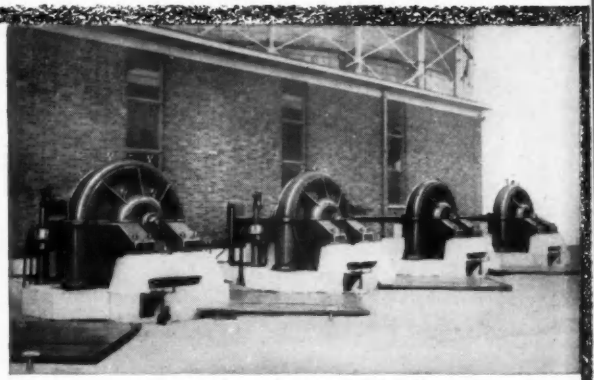
Holders of British Standards Institution Licence No. 2774 under B.S. 2797 : 1956

THE DIAPHRAGM & GENERAL LEATHER CO. LTD.

FRANKLIN ROAD WORKS, PORTSLADE, SUSSEX.
Telephone: Hove 47266/7 Telegrams: DIAPHRAGM, PORTSLADE.

Specialists for over a hundred years in **LEATHERS FOR THE GAS INDUSTRY**

in step with progress... Donkin Type VHP180 Gas Boosters



Four Donkin Type V.H.P.180 Gas Boosters.

Two of the Boosters are driven by 180 H.P. Squirrel Cage Electric Motors through Scoop controlled Fluid Couplings, and two by 'Ruston Paxman' 4 Cylinder Oil Engines with Centrifugal clutches. The Booster speeds are controlled by Donkin control equipment to maintain the required outlet pressure, in both the case of the electrical and oil engine driven sets.
The Boosters incorporate weatherproof features for operation in the open air.

Range of duties from :
300,000 cu. ft./hr. with a 4" w.g. differential to 1,500,000 cu. ft./hr. with a 24" w.g. differential and a possible future duty of 40" w.g. differential pressure.

The **BRYAN DONKIN** Co. Ltd.

THE BRYAN DONKIN COMPANY LIMITED, CHESTERFIELD

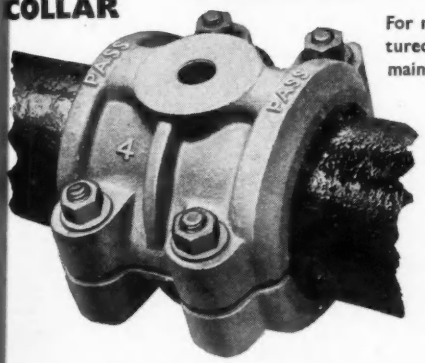
FRACTURED MAINS?

REPAIR WITH PASS
GAS AND WATER ENGINEERS

LEAK CLAMPS

Made to suit all classes of pipes up to 48" dia., Pass Leak Clamps for repairing socket and spigot joints have been designed for fast, easy assembly.

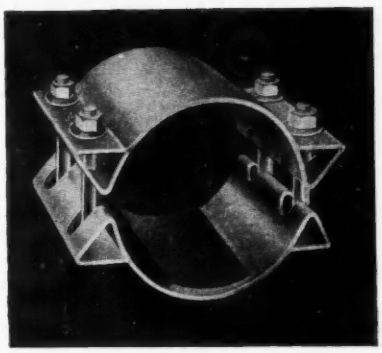
LEADLESS SPLIT COLLAR



For repairing fractured gas and water mains underpressure

STEEL REPAIR CLAMPS

Badly pitted and corroded pipe lines are repaired quickly and economically with the help of Pass Steel Repair Clamps.



Leaflets giving full details available on request.

PASS
GAS AND WATER ENGINEERS

Specialists

IN UNDERPRESSURE ENGINEERING

E. PASS & CO. LTD., DENTON, MANCHESTER

Tel.: Denton 3001/2/3 Grams: "Tools" Denton, Manchester

dmPA104

Gas Journal

VOL. 299 No. 5007 August 19, 1959

IIITH YEAR

MANAGING DIRECTOR : Clifford A. King

EDITOR : Geoffrey W. Battison

ASSISTANT EDITOR : Colin J. Godbold

TECHNICAL EDITOR : Charles J. P. de Winton, T.D., M.A., M.Inst. Gas E., M.Inst F.

Published by Walter King Limited,

11, Bolt Court, Fleet St., London, E.C.4

Telephone: FLEet Street 2236-7 Telegrams:- Gasking, Fleet

CONTENTS

EDITORIAL COMMENT

Complete Gasification at Watford - 75
Warren Spring - 76
Grand Final - 77

NEWS OF CURRENT EVENTS

Personal - 78
Obituary - 78
Scottish Women Attack 'Monopolistic Practices' - 78
North of England Officers Elected - 78
Loyalty in the Gas Industry - 79
Substantial Rise in Sales of Major Appliances Last Year - 79
North Thames' 2,000 Long Service Awards - 79
Evered Commemorate 150th Anniversary - 79
Opening of Warren Spring Laboratory - 80
Lorry Drivers Win Prizes - 81
Brechin Utilities Must Make Good Road Digging Damage - 81
Coke Oven Contract - 81
Record Fridge Sales - 81
Re-organisation has Involved S.G.B. in Extensive Education Programme - 82
U.S.S.R. Gasification Plans - 82
Wanted: Enterprising Papers, More Theory - 82
Eastern Section Annual General Meeting - 83
Company News - 84
International Pipe-line Standards - 84

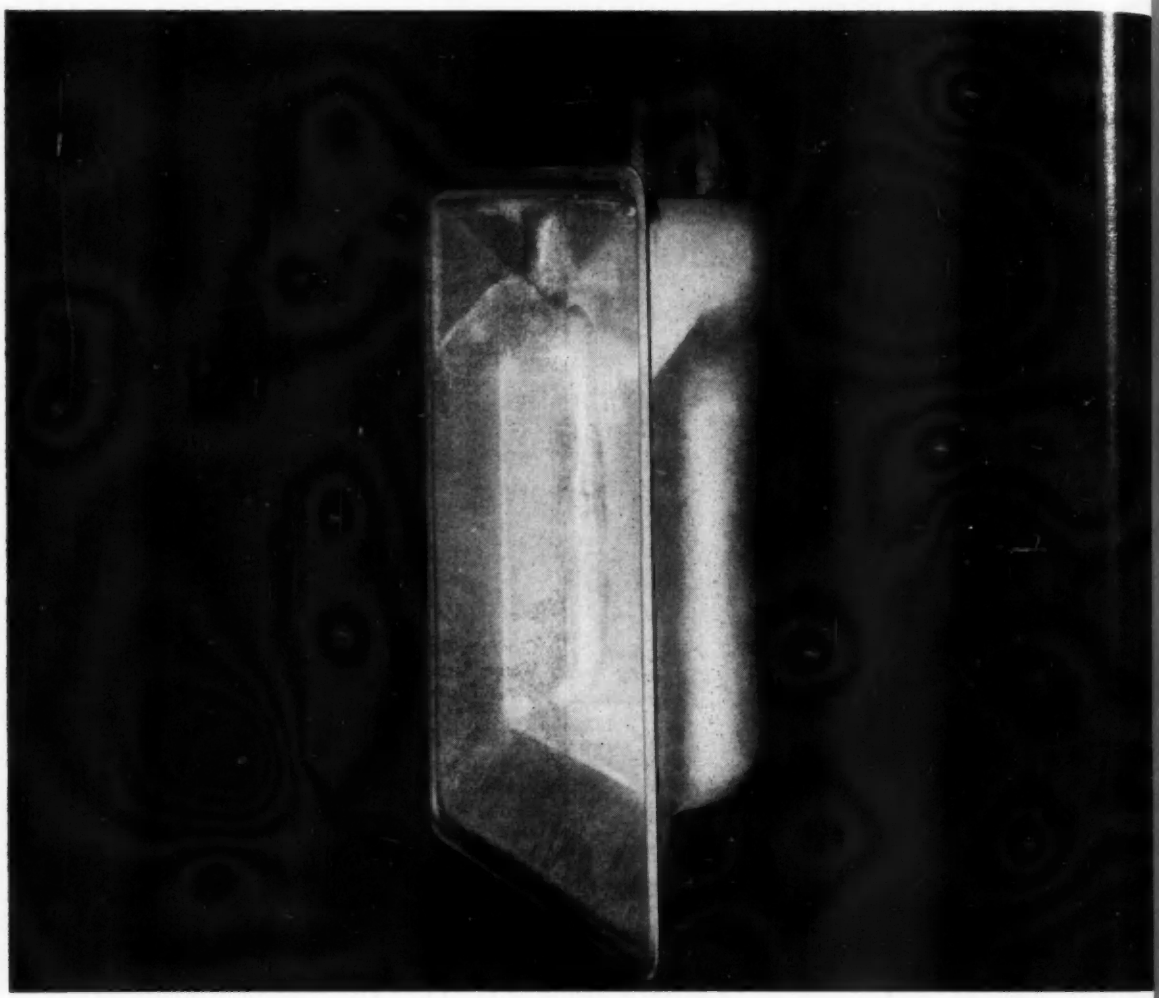
TECHNICAL RECORD

Measurement for Control. By J. C. Hogg - 85

GAS IN INDUSTRY SUPPLEMENT

Editorial Comment: Mastery in the Foundry - 171
Heat Treatment—a Service by the West Midlands Gas Board.—By Eric Ford - 172
Foundry Processes.—By J. Ward - 176
I.G.D.C. See Large-scale Heat Treatment Plant - 183
Ductair Heating System for College - 183
Industrial Gas in an East Anglian Division. By R. F. Saggers - 184
Hagrane Dual-purpose Drier Fired by Gas or Coke - 189
For Farmers Who Need a General Purpose Unit - 189
Diecasting Firm Finds Gas the Most Reliable of Fuels - 190
Giant Spray Booths Equipped with Gas - 191
Five Seconds to Serve a Meal in New Staff Restaurant - 191
East and West Midlands Gas Boards at Foundry Exhibition - 192

PUBLISHERS' NOTICE, See Page 360, May 27, 1959



There is more in gas metering than meets the eye

This is a diaphragm pan of a Zephyr meter.

Shaped from best quality tinned steel in a one-piece pressing, its formation controls the configuration of the diaphragm and thereby assists in maintaining a consistent capacity for each revolution of the meter.

It is the thorough design, meticulous manufacture and careful assembly of each component that has made Parkinson Cowan meters so famous for long life with consistent accuracy.

PARKINSON COWAN GAS METERS

Terminal House, 52 Grosvenor Gardens, London, S.W.1 · SLOane 0111

1959

Gas Journal

VOLUME 299 No. 5007 AUGUST 19, 1959 111th YEAR

Complete Gasification at Watford

MUCH has been written and said about the changing face of the gas industry. Indeed, the wealth of gasification processes now offered must present a pretty problem to gas boards considering the installation of new gas-making plant. Add to this an unpredictable change of conditions *after* the contract has been placed and/or the plant installed, and the position becomes even more complicated.

These reflections follow the hearing of an excellent paper presented by Mr. K. C. Rees and Mr. J. F. Smith to the meeting of the Eastern Section, I.G.E., at Lowestoft entitled 'Practical Consideration of Complete Gasification—Watford.' The paper evoked an extremely interesting discussion.

A primary factor in the decision to install this complete gasification unit was, of course ,the insistence upon the need to find alternative carbonising fuels to replace high-grade coals which were increasing in price while diminishing in availability. The plant was installed by the Eastern Gas Board in an attempt to stabilise costs at the Bushey works; the price of coal delivered to Bushey Sidings being among the highest in the country.

The intention was so to design the unit that the plant would be flexible and capable of producing varying types of gases from low-grade coals or from coke. Oil admission facilities were also provided for carburetting gas and heavy oils, for the enrichment of either blue water gas or bituminous water gas. The authors state, however, that no attempt has yet been made to use oil when gasifying coal, but rather to persist in proving the value of the plant as a substitute for existing producer gas diluent.

The plant, installed by Power-Gas Corporation Ltd., is based broadly upon the Gas Integrale plants which have been operating for some years on the Continent, and upon which Professor Giordano of Naples presented a report to the I.G.U. conference in Brussels in 1952. Briefly, it incorporates coal handling and storage plant, generator with superimposed retort, carburettor, superheater, waste heat boiler, Lymn washer, condenser, ammonia washer, exhausters and tar extractor. An interesting feature, too, is the incorporation of a Howden Upflow grit arrestor fitted at the outlet of the waste heat boiler below the stack valve and thus maintained under plant pressure. The authors comment that this has proved most effective, grit emission being kept to the absolute minimum.

The Watford complete gasification plant has now been in intermittent operation for some 2½ years, and the authors give a very full and frank report of the results so far achieved, which as yet have not reached the degree of yield and efficiencies first anticipated.

One of the unlooked-for factors vitally affecting the cost of production has been the sharp rise in cost of raw material. Three coals have been employed—Baddesley, Woodside and Clifton. In 1953 the price of Baddesley coal delivered to Bushey Sidings was 78s. 6d. per ton. In 1956 Woodside coal was priced at 98s. 4d. per ton, rising to 108s. 4d. per ton in 1958; while Clifton coal—which has been used latterly and seems generally to offer better properties for use in this type of plant—is currently priced as high as 116s. 10d. per ton delivered. Moreover, the coals have not been consistent in respect of grading, and the authors state that a feature common to all is their rapid disintegration on handling and marked deterioration in storage. These factors obviously affect adversely the economics of the process, due to the percentage increase in the quantity of coal rejected prior to carbonisation. It is fortunate that use has been found for the 'fines' in judicious admixture with the stored coal intended for use in the horizontal retort plant.

Teething troubles with the plant itself were to be expected, and have centred largely around the dry seal generator grate. The authors state that since commissioning, the plant has been closed down on three occasions due to grate faults, but modifications which have been carried out have proved successful and the makers are considering further improvements in design.

The discussion was opened by Mr. J. H. Dyde, Chairman, Eastern Gas Board, who outlined the

reasons which led the Board to decide upon the installation of this plant at Watford for production of low c.v. gas which could be mixed with high c.v. gas from the horizontal carbonising plant, and which could also operate as a carburetted water gas plant if required. By the time the plant was ready for commissioning in late 1956 the Board learned that the Baddesley coal would no longer be available, although a supply was made available for test runs. At the outset, therefore, it became apparent that higher-priced coals would have to be employed.

Mr. Dyde paid tribute to the authors for the great amount of work they had done in overcoming difficulties and obtaining satisfactory results with the coals available, also to Power-Gas Corporation Ltd. for their full co-operation on the mechanical and structural side. He believed that there was no reason why, given suitable coals, the results originally hoped for should not be achieved. Probably the best way in which to use low-grade coals was in large-scale plants sited at or near the coalfields; and upon this research was being actively pursued. Meanwhile smaller types employing these low-grade weakly-caking coals would have their place.

Mr. W. A. Evetts, M.C., Divisional Engineer, Watford Division, regarded this paper as being, rather, an interim report upon the performance of the complete gasification plant. He referred to certain differences between this plant and the 'G.I.' plants on the Continent, and to some features which had tended to cause trouble. Gas-making efficiencies quoted in the paper, of 52.3 and 50.5 respectively, were low but he had no doubt this could be raised with a more extensive operational period. He made the telling point that, although it was all very well for the Coal Board to urge the use of low-grade coals, the price of such a coal as Clifton on a dry ash-free basis was in fact only about 2s. a ton cheaper than a first-class Yorkshire coking coal on a dry ash-free basis.

Mr. E. H. Winch, Divisional Engineer, Cambridge Division, raised a number of practical points, e.g., could the authors say how selective the plant really was regarding the coals which could be used in it; the availability of suitable coals and how many of them could be bought at prices which made the process economically attractive? Did the plant's selectiveness regarding size of grading and fusion range of ash impose a serious limitation upon the coals which can be used? Would plant operation be notably complicated if variable mixtures of coal were fed to it, as often occurs in normal carbonising practice? Automatic equipment would appear to be appreciably greater than was customary in a fully-automatic water gas plant.

Mr. E. O. Rose, Chief Engineer, Eastern Gas Board, discussed the paper not so much in relation to the difficulties attendant upon coal supplies, the carry-over from the generator, etc., which he felt would be overcome; but rather by way of an assessment of the position in which plants of this type stood in relation to present-day gas-making requirements. In so far as the plant succeeded in gasifying coal without any solid fuel residue, the term complete gasification could be substantiated; but it did not make a 'complete gas.' Mr. Rose dealt in some detail with the question of carbon-hydrogen ratio. Taking a 500 B.t.u. continuous vertical gas as normal, town gas has a C:H ratio of 2.7; while in some of Dr. Dent's gases the C:H ratio was as low as 2.3. The whole process of gasification had become one of turning out the carbon and replacing it by hydrogen. In carbonisation this happened naturally, the carbon being thrown out as coke. Complete gasification demanded the absorption of the carbon into the process without it appearing in the gas—a difficult task. The gas produced in the Watford plant had a CO content of 30% and a C:H ratio of 4.4. Judged by present-day standards in this country, that was not a gas that should be distributed as it stood. Plants of this type, therefore, should be used only as auxiliaries to some other process of gas manufacture; as, indeed, was being done at Watford. The speaker saw the plant as an alternative to other types of dilution plant—but new processes of manufacture would be coming into operation in which dilution would play no part.

The authors replied to various points raised by speakers, and Mr. Smith thought an ultimate efficiency figure of 56% could be hoped for. Mr. T. H. Riley (Power-Gas Corporation Ltd.) also contributed, pointing to special considerations involved in a prototype plant used as a production unit.

Mr. T. C. Battersby (Controller, Tottenham/Watford Divisions), in proposing the vote of thanks to the authors, congratulated them both upon the work they had carried out and the excellence of the paper they had presented. Whatever one felt as to the present and probable degree of success, much useful information had been obtained.

Our own comments must be very brief. Is the Watford plant a success? At present, partially so, though undoubtedly greater efficiency figures can be achieved. Whether it is a 'complete' gasification plant is another matter. From the facts set down it seems obvious that it cannot be regarded as other than an auxiliary. As such, despite its apparent flexibility compared to some other forms of dilution plant, it does seem to fall into the same general category. One cannot see a great future for such plants; but credit is due to the Eastern Gas Board for a bold experiment, and to the authors for, as Mr. Battersby remarked, a tenacity characteristic of the gas engineer.

Warren Spring

THE opening of the new Warren Spring laboratory at Stevenage by the Lord President of the Council, Viscount Hailsham, recently, is of particular interest to those connected with the fuel industries. This is not because the volume of research to be carried out by the Department of Scientific and Industrial Research is going to be increased, but rather because it is going to be reduced. This new laboratory is to supersede the activities of the Fuel Research Station at Greenwich, which as its name would suggest, very largely confined its work to fuel research. In fact, it was one of the very first organisations to concentrate on this particular branch of research.

Since it was set up some 40 years ago, conditions have changed; more space was needed if up-to-date technological research was to be undertaken and other bodies, notably, B.C.U.R.A., have come into the field, and are

carrying out work on similar lines. When, however, through the unsuitability of some of the buildings at Greenwich and the impossibility of obtaining land for expansion, a move became inevitable, the D.S.I.R. decided to take the opportunity of broadening their activities and to undertake other lines of research in a new laboratory.

Since fuel research was only going to be a very minor activity—only two projects from Greenwich are being continued at Stevenage—a change of name avoiding any link with the past was essential. The name, Warren Spring, which has been adopted, is that of the lane running across the site on which the new laboratory has been built.

The laboratory building itself is of interest in that it has been built on very modern lines in something like 14 months, and enough land has been purchased for a possible 200% expansion in the future. The speed of construction is remarkable when it is realised that the main laboratory building is 372 ft. long by 37 ft. 6 in. wide in three storeys, but it illustrates the possibilities of modern techniques using standard units as bases of construction. With the corridors and secondary staircases as the only solid internal walls, the enormous flexibility of the building is immediately apparent. In fact, in his speech at the opening ceremony, the Lord President described the laboratory as an experiment in itself.

It will be equipped with the best possible apparatus to carry out research either for industry or that initiated by some other branch of D.S.I.R. which cannot be done better elsewhere. The staff will be about the same size as that at Greenwich and clearly of equal calibre. A point of organisation which occurred to us as being particularly sound, was the provision of physical and chemical services. Anyone who has undertaken a line of research will realise that a great deal of time is taken up in chemical analysis of both ancillary and final products as well as certain physical measurements. These are often far better undertaken by specialists, who, by using expensive special apparatus economically, can save much time and can guarantee a very high constant standard of accuracy.

It is not quite clear what type of work the new laboratory is contemplating, other than the technological research on ore dressing now in hand, but it is likely to be very broadly based and not confined to basic scientific measurement. The work on fuel technology inherited from Greenwich, is confined to measurements and other aspects of atmospheric pollution, and experiments on the Fischer-Tropsch process of oil production from coal. Both of these, we feel, are of the utmost importance if the demands of the Clean Air Act are going to be met without too much dependence on imported fuels, and are rightly being carried out by a Government sponsored research organisation.

It may perhaps be a little too early to form an opinion of what the future has in store for a modern laboratory of this potential, but we think it is clearly a sign of the times and an indication of the great importance attached to civilian research of all types by the present Government, that Warren Spring has come into being and so speedily. The first five year plan for the development of scientific and technological expansion came to an end last March and this laboratory was clearly a 'must' before any great progress could be made by the Government in furthering its plans. In any case, its existence is a clear indication that the country is well aware of its responsibilities in this scientific age.

Grand Final

THE lofty spaciousness of Olympia echoed with the thousand raucous noises to be expected at the Hulton's Boys and Girls Exhibition, with its usual paradisiacal congregation of aircraft, tanks, ships, films, ice-creams, pop and animals. Amid such glorious attractions, the high spot of the exhibition last Friday was the prize-giving ceremony at the conclusion of the Master Therm and Miss Therm competition, sponsored by the Gas Council. On the stand were the winners, aged 16 and 15 respectively. Each were presented with their titles and £100 in Premium Bonds. They had been through stiff tests before qualifying for the Grand Final. These included a written questionnaire covering knowledge of simple first aid, shopping and general hygiene in the home and a simple cookery test. These stages in the competition had been organised by the 12 boards.

The Grand Final comprised a cookery and kitchen planning test. The object was to find the boy and girl with the best all-round ability to handle emergency situations at home if, for example, mother had to be confined to bed for a few days. The judges, Lieut.-Commander (S) A. E. Charman, M.B.E., Miss B. Briant, of the Ministry of Education and Miss Catherine Lough, former vice-principal of the National School of Cookery, decided that Terence Palmer, of Porchester and Susan Cox, from Staines, Middlesex, were the winners.

As Mrs. Phyllis Craddock, who presented the prizes, said it seemed apparent that boys were taking a greater interest in the culinary arts than previously. Perhaps this is as well, now that so many young wives continue at work.

Despite counter-attractions, the number of spectators lining the rails at the prize-giving was such that viewing became somewhat difficult. In parenthesis, perhaps it might be as well another time to remove the cooked meals immediately after they have been judged. Nothing looks worse than food gone cold.

But this was a fine competition, introducing, as it obviously did, the responsibility to younger minds of being able to cope with misfortune in a household.

Fire Protection

THE Fire Protection Association has published a revised edition of its booklet *Industrial Solvents and Flammable Liquids* which first appeared in 1954. Intended primarily as a work of reference, the booklet is set out in tabular form and provides information on the physical properties of some 400 liquids, under various headings. The edition contains a temperature conversion table which many will find useful.

Copies of this booklet are obtainable from the Fire Protection Association, 31-45, Gresham Street, London, E.C.2. Price to non-members: 3s.

Personal

MR. P. C. L. CROXTON, former assistant engineer at the Shrewsbury gasworks, has been awarded the Taylor-Woodrow prize at Birmingham University where he is reading for a degree in civil engineering. The prize is in the form of a travelling scholarship to enable students to visit engineering works on the Continent. Mr. Croxton will go to Holland and Belgium. He entered Birmingham University as winner of a West Midlands Gas Board scholarship.

MR. A. R. BENNETT, has taken up an appointment with United Gas Industries Ltd., Engineering and Appliance Division based on Exeter, as Technical Consultant.

MR. L. DOBSON, Engineering Director of Imperial Chemical Industries Ltd., Plastics Division, is leaving I.C.I. Ltd. at the end of August and joining the board of Simon-Carves Ltd. as a director.

MR. B. G. H. CLEGG's title, the Southern Gas Board announces, has changed from Statistician to Market and Operational Research Manager.

MR. NATHAN E. TANNER has been elected President of the Canadian Gas Association.

Obituary

MR. JOHN GOODRICH KAY, a director of Lafarge Aluminous Cement Co. Ltd. since its inception in 1923, and chairman since 1948, has died.

MR. FRED HALL, sales representative of the Economic Gas Boiler Co., Ltd., has died.

MR. ROBERT HARRY MCGREGOR, a former gas engineer-manager, of Coalville, Leicestershire, has died, aged 76.

Glasgow firms take their time

Industrial and commercial firms in the centre of Glasgow have, so far, been slow to install the equipment made necessary by the smoke control Order which comes into operation on October 15. Already half the period of six months' grace has gone.

The Medical Officer of Health for Glasgow said that the pace of conversions had not been fast enough. The Order, he added, affected 367 households and about 4,000 commercial and industrial firms. There was now in progress a survey of properties south and west of the scheduled smokeless control area with a view to extending the Order within the next few years.

A plan, costing £3.75 mill. and spread over ten years, to convert fireplaces to burn smokeless fuel, has been approved by the Edinburgh Corporation Health Committee.

A presentation dinner was held at Cardiff last month to show appreciation by members of the Wales area joint councils to Mr. R. S. Snelling, O.B.E., for his outstanding services. The function was chaired by Mr. T. Mervyn Jones, Chairman or the Board, and the toast of the guest was proposed by Mr. E. M. Edwards, Deputy Chairman of the Board. Mr. William Howlett, M.B.E., spoke on behalf of the Wales area joint industrial council and Mr. J. M. Malone on behalf of the Wales area joint council for gas staffs and the Wales area joint committee for senior gas officers.

Scottish women attack 'monopolistic practices' of electricity boards

THE first Scottish conference of the Women's Gas Federation, held in Edinburgh recently, sent a telegram to the Secretary of State for Scotland protesting against monopolistic practices by the Scottish electricity boards.

The telegram drew the attention of the Secretary of State to 'the need to ensure freedom of choice for the housewife in the fuel she uses in her home in new housing estates, where in many instances gas is being excluded and electricity given a complete monopoly.'

The telegram added: 'This is contrary to the interests of democracy and against declared Government policy of free competition.'

The protest was made after Mr. Sydney Smith, Chairman of the Scottish Gas Board, had criticised the electricity boards for abusing the power of monopoly.

He said that the gas industry of Scotland had suffered considerably from a type of competition from electricity which he thought was quite unfair.

Undemocratic

'The electricity boards have on numerous occasions offered to supply electricity supplies free for new local authority housing if gas is excluded from the houses,' said Mr. Smith. 'This means that tenants are denied freedom of choice. I find it difficult to speak with restraint on a process which is so fundamentally undemocratic.'

The gas authorities, he said, would not be able to bring their prices down. 'Indeed, we shall probably have to increase them because of rising costs,' he said.

He added that there were still many people who were not benefiting as much as they might from the introduction of the two-part tariff. 'We know for a fact that throughout Scotland only between 35 and 40% of the number of consumers who could immediately benefit have, in fact, applied for it. Many people are paying too dearly for their total domestic fuel requirements.'

NORTH OF ENGLAND OFFICERS ELECTED

OFFICERS elected at the eighth annual general meeting and ladies' day of the North of England Section, I.G.E., were: Chairman, Mr. A. Field; Senior Vice-Chairman, Mr. B. Richardson; Junior Vice-Chairman, Mr. K. E. Brown; Honorary Secretary, Mr. J. R. Matthew; Honorary Treasurer, Mr. W. Cumming.

The meeting, with Mr. F. J. Webster in the chair, was held in West Hartlepool. Over 100 members and guests attended.

While members attended the business meeting, the ladies were entertained by a demonstration and talk on the art of flower arrangement.

At the meeting Mr. Webster presented his chairman's address, entitled 'The Last Decade and the Next.'

At lunch the toast of the guests was proposed by Mr. Field, and Mr. W. B. Wells, Ministry of Power, responded.

The toast of the 'Northern Gas Board' was proposed by Mr. B. Richardson, and Mr. John F. Jackson, Secretary of the Board, replied.

The party then visited the Cerebos salt works at Greatham.

Loyalty in the gas industry

A TRADITIONAL tribute to the charm and beneficial influence of 'The Ladies' was paid by Mr. G. F. Oliver, M.B.E., the Chairman of the South Western Section of the I.G.E., when he proposed that chivalrous toast at the Summer meeting and ladies' day, held at Bath on June 24.

'If systems in the industry have wrought changes during the past decade —and who can deny that they have— at least there has been no change in the loyalty of gas engineers,' he said. 'In this the ladies have played a large part, and I take this opportunity of placing on record our gratitude to them.'

Keener competition

Mr. Oliver spoke of the industry's traditions, of which they were so proud, and of the way in which the industry had met competition over the years. 'Today competition is keener than ever,' he said, 'but with the new developments in hand we have no fear of the future.'

Responding to the toast, Mrs. W. B. Claridge, wife of one of the South Western Board's Regional Managers, referred to gas engineers' wives as silent ambassadors for gas. Perhaps 'silent' was not quite accurate, she added, for through the activities of the Women's Gas Federation, the wives could play their part in furthering the activities of the industry. Her own branch at Swindon had just celebrated its 21st birthday, and that surely spoke for itself. Mrs. Claridge concluded by paying a special tribute to the efforts of the Section's Hon. Secretary and Treasurer, Mr. F. C. Gay, M.B.E., whose efforts behind the scenes had contributed so much to the success of the day.

Show place

During the morning members visited the production control centre at the Bath manufacturing station, while in the afternoon, accompanied by their ladies, they enjoyed the 18th century beauty of Stourhead House and gardens, one of the finest show places in the country.

North Thames' 2,000 long service awards

Over 2,000 long service awards have been made since nationalisation by the North Thames Gas Board to employees who have completed 40 years service with the gas industry.

This was revealed by Mr. M. Milne-Watson, Chairman of North Thames, when he presented awards to the latest 41 qualifiers, saying they were typical of the 2,000 who had gone before them with their family records of service with the industry, and their many and varied activities, outside their work, mainly aimed at service to the community.

SUBSTANTIAL RISE IN SALES OF MAJOR APPLIANCES LAST YEAR

ALTHOUGH the effect of the abolition of hire-purchase restrictions took effect only during the latter months of the year ending March 31, 1959, sales of all the major gas appliances showed considerable increases over the full 12-month period. Gas cooker sales were 127,000 higher, space heater sales 70,000 higher and water heater sales 42,000 higher, while sales of gas refrigerators more than doubled.

Total gas sales for the 12 months (on the basis of meters read) showed a slight decrease of less than ½%. Although industrial sales were lower, domestic sales were a little higher.

A relatively warm March and the early Easter holiday caused a large reduction in the demand for fuel generally. Provisional sales statistics show that, for the financial year, sales to domestic consumers were almost unchanged and sales to commercial consumers about 1% higher, but, industrial sales were nearly 2% lower. The average revenue per therm of gas sold rose from 20.2d. per therm in 1957-58 to 21d. in 1958-59.

In the year ended March 31, 1959, coal gas production was 6% lower, and the quantity of coal carbonised 7% lower than in the previous year. Water gas production was 2½% higher, but coke used for this fell by about ½%. The quantity of oil used in water gas production increased by 10 mill. gal.—about 7½% higher.

Purchase of surplus gas from coke ovens and oil refineries rose by 5½% so that, although total gas production was more than 3½% lower, the amount of gas available was only 2½% less.

Coke production was 7½% below production in the previous year and sales during 1958-59 were more than 5% less.

Production of crude tar was 7½% less and of crude benzole 9% less.

The sales of all the major appliances increased during the year. The number of cookers sold was 667,000, and of gas space heaters 194,000, an increase of 56%. Sales of water heaters totalled 198,000, an increase of 27%, wash boiler and washing machine sales increased by 4%, and refrigerator sales from 22,000 to nearly 50,000.

New daily gas-making capacity of 24 mill. cu.ft., mainly oil gasification plant, was brought into use during the quarter January to March, 1959. The total capacity of new plant brought into use during the year was 114 mill. cu.ft. daily compared with 115 mill. cu.ft. in the previous year.

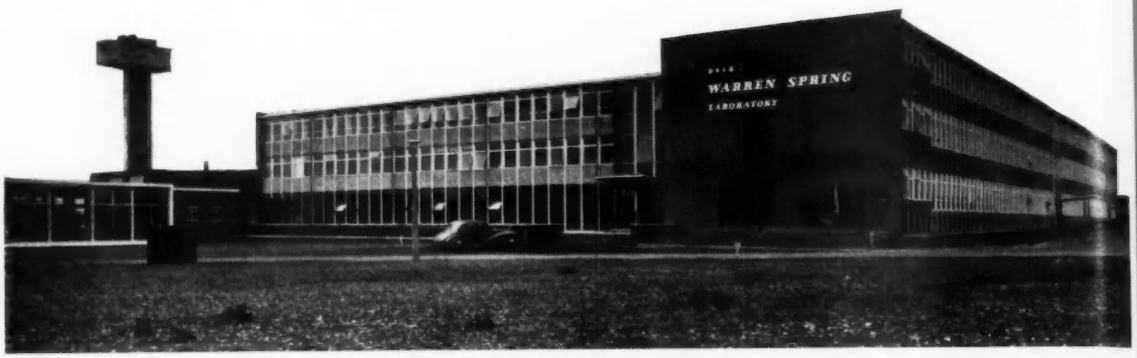
Four hundred miles of new mains were laid during the quarter, bringing the total mileage of new mains laid in the year to 1,712, 12% less than in 1957-58.

Between the end of April, 1958, and the end of April, 1959, the number of persons employed in the gas industry decreased by 4,200 to about 131,100.

EVERED COMMEMORATE 150th ANNIVERSARY

A coffee service, engraved with the civic arms of his county borough, was presented to the Mayor of Smethwick, Councillor John Randle, by Mr. W. L. Burrows, Chairman of Evered & Co. Ltd., as part of the company's 150th anniversary commemoration in June. The occasion was a luncheon given by the Directors to a party of councillors. Mr. C. H. Wilson, Assistant Managing Director of the company, addressed another reception, presenting a short history of the company. He spoke also of the bonus paid to employees, amounting to £1 for each year's service, with a ceiling of £25. Pensioners of the company received a 14 to 15% increase to mark the occasion, and shareholders an extra dividend of 6d. a share. A tour around the works followed Mr. Wilson's address, and employees, their friends and families later visited the works on an open day.

LABORATORY MARKS A NEW PHASE IN WORK OF THE D.S.I.R.



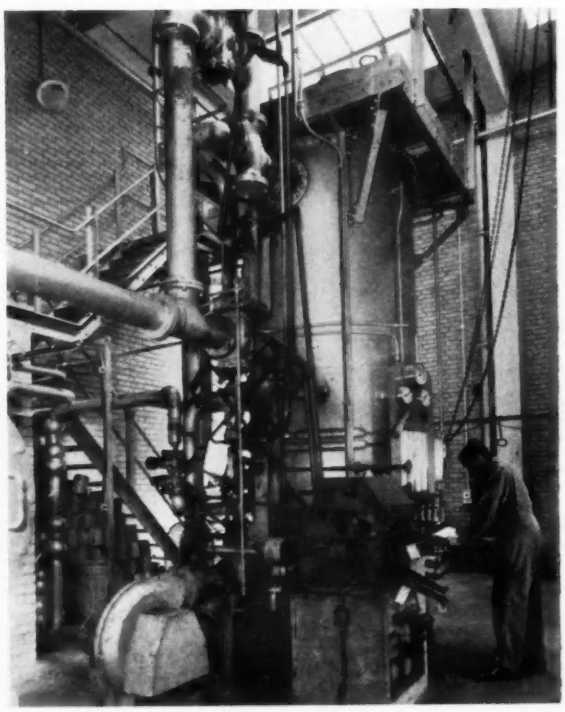
Warren Spring

THE opening of the Warren Spring Laboratory of the Department of Scientific and Industrial Research at Stevenage, Herts, by the Lord President of the Council, Viscount Hailsham, re-recently marks the beginning of a completely new phase in the Department's function and objectives. So keen was the Department that no impression should be given that the activities of the Fuel Research Station, which this laboratory replaces, were going to be continued, that it decided that a completely different name should be found. The new laboratory is called after the lane which used to run across the site.

Of the work carried out at the Fuel Research Station, only two programmes have been transferred to the new laboratory. These are research into the abatement of atmospheric pollution and the synthesis of oils and chemicals from the carbon monoxide and hydrogen by the Fischer-Tropsch process.

Indications showed that there was a demand for research in the field of mineral processing and for facilities for pilot scale work on various projects, which the D.S.I.R. had not hitherto been able to meet. With such needs in mind, a laboratory has been designed and built in the modern industrial style to be as flexible as possible, to house a staff equal to that of the Fuel Research station, and to be provided with facilities for both laboratory research and pilot scale plant. Sufficient land has been purchased to allow approximately 200% expansion of the present buildings at some future date.

The total cost of the new laboratory, including buildings, services, laboratory fittings, library bookshelves and all site works was approximately £620,000, equivalent to a rate of £6 7s. per sq. ft. The Ministry of Works were responsible for the design of the site, buildings and all services.



The small manually-operated blue water gas plant used for making gas for the experimental Fischer-Tropsch plant.

*

*

Three-storey

There are two pilot scale buildings each 90 ft. by 55 ft. by 37 ft. 6 in. high, linked to the main laboratory block by a corridor with small scale laboratory units on each side. Workshops and engineering stores occupy a large steel-framed building consisting of six east-light bays 60 ft. by 30 ft. high. A three-storey administrative block runs at right angles to the main laboratory buildings. These consist of two main sections; the section in which the actual research work is taking place and a second section where physical and chemical services are provided.

In the latter all physical and chemical measurements and analyses are carried out by specialists using modern apparatus. In this way research workers are relieved of the need of doing the ancillary work connected with their investigation with a consequent saving in time, making possible a greater load factor on expensive special apparatus, providing a guaranteed degree of accuracy which might not be forthcoming in the time available and avoiding the

possible duplication of much work, almost of a routine nature, being carried out in the same building simultaneously.

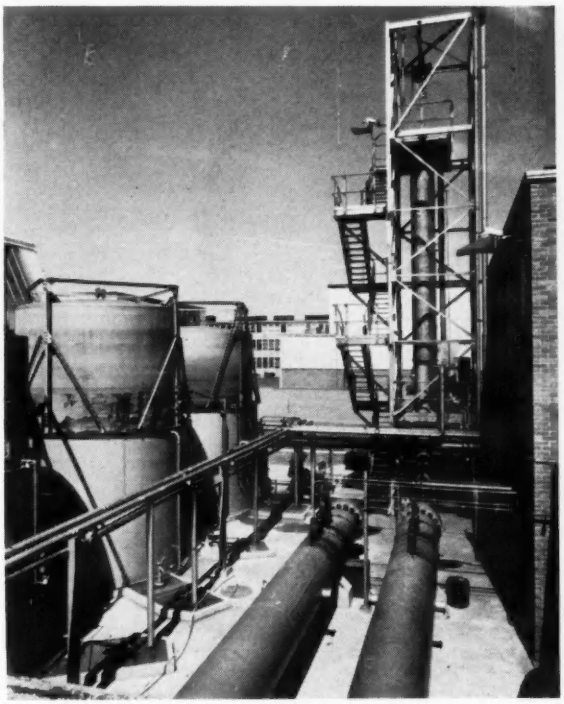
The process work, sponsored by the Ministry of Power, now being carried out, is an investigation into the production of oil from coal. Blue water gas made from low-grade coal and rendered sulphur free is stored at 120 atmospheres. This section of the plant has been supplied by Humphreys & Glasgow, Ltd. In the catalyst section, it undergoes treatment in the presence of an iron catalyst in the form of a slurry. By altering the $CO:H_2$ ratio in the water gas and the conditions of temperature and pressure under which the reaction is carried out, much useful information about the type and relative quantities of products formed can be found.

Five-year plan

In his speech, the Lord President referred to the five-year plans for civilian research initiated by the Government and said that the building now being opened might be said to be the final and perhaps the best product of the first five-year plan that ended in March. Among D.S.I.R. research stations, it was a laboratory with a new look and a new name had been chosen to avoid any implication of restriction in its field of activity.

It was a laboratory which did not merely do experiments, it was itself an experiment and its activities would only be limited by its brains and its tools, both of which would be made as good as possible. Its facilities could be used for developing on a large scale any idea or invention which might arise elsewere in the D.S.I.R. or in industry itself. Here was a laboratory which was willing to undertake on repayment any job within the limits of its knowledge, its ability or its facilities which could not be done better elsewhere.

*



Exterior view of the plant at Warren Spring, showing the two compensating holders on the left, part of the purification plant in the background and the high pressure storage vessel in the foreground.

*

Lorry drivers win prizes

DRIVERS of the Southern Gas Board's Wight and Portsmouth region had a good day in the Portsmouth eliminating contest for the Lorry Driver of the Year competition. The seven-man team won three cups and tied for a fourth.

The Board again placed Hilsea gasworks at the disposal of the organisers. Mr. J. C. Hogg, Regional Production Engineer, assisted Alderman J. P. Lacey, Chairman of the Portsmouth Accident Prevention Council, to start off the vehicles along a 13-mile test route through the city to the Royal Marines Barracks at Eastney. A variety of very difficult tests awaited the drivers.

Drivers of the South Western Gas Board have won the following awards in the National Safe Driving Competition, 1958: Two '10-year' medals, 100 '6-9 year' bars, 41 '5-year' medals, and 249 diplomas.

BRECHIN UTILITIES MUST MAKE GOOD ROAD-DIGGING DAMAGE

IF the Scottish Gas Board or other public body wants to dig up Brechin streets in future, it will have to undertake to restore the streets afterwards to their former state.

The Scottish Gas Board was accused at meetings of Brechin Town Council Roads Committee of leaving two streets in a mess. It was alleged that only 60 to 70% of the sand dug out of trenches was put back. The rest was lifted in a lorry. The result, it was stated, was that the surface started sinking whenever a heavy vehicle ran over it.

Ex-Provost Eddie said that they should take the matter up with the Gas Board, Hydro-Electric Board and the Post Office telephone department, and tell them that they were not properly reinstating roads after digging them up. He did not expect them to replace all the sand, but they could at least put back 90%.

It was stated that in England if the reinstatement was unsatisfactory the public utility undertaking had to pay for the second reinstatement.

It was agreed to defer a decision to enable the clerk to determine their exact powers. It was further agreed that, if any public bodies made a request to dig up their streets, permission would be granted only on the understanding that trenches were filled in to the satisfaction of the burgh surveyor.

Coke oven contract

Woodall-Duckham Construction Co. Ltd., has been given a contract by Colvilles Ltd., to build a complete coke oven and by-product plant costing about £2¼ mill. This is in connection with the next stage of the Colvilles developments at their Ravenscraig works and will be the fourth complete coke oven installation built for the same company.

Record fridge sales

IT is estimated that almost half-a-million housewives have bought a new refrigerator this year. Already, last year's sales total of 448,646 domestic refrigerators sold, has been passed—with five months to go.

Despite an unusually good summer, the new record is exceptional. Last year, the previous record year, sales were some 60% higher than in 1957.

Since January 1, 1958, just under 1 mill. refrigerators have been installed in British homes—a total which was only equalled over the six years between 1952 and 1957. In fact, housewives bought more refrigerators this year—in April alone—than they bought during the whole of 1952.

But over three-quarters of British homes are still without a refrigerator. In America almost every home has one.

For their summer meeting members and their ladies of the London and Southern Section made a short tour of Poole works before embarking on pleasure steamers for a cruise back to Bournemouth. Lunch at the Pavilion, Bournemouth, was attended by the Mayor and Mayoress, Mr. C. H. Leach, Chairman of the Southern Gas Board, and a number of the Board's executives. Our picture shows the Mayor and Mayoress of Bournemouth with Mr. C. H. Leach, and Mr. J. C. Hogg, Chairman of the Section.

Re-organisation has involved S.G.B. in extensive education programme

SPEAKING at the luncheon of the summer meeting of the London and Southern Section of the I.G.E. at Bournemouth, Mr. C. H. Leach, Chairman of the Southern Gas Board, referred to the major reorganisation that had taken place in his Board's area in the last 2½ years. This had meant an extensive education and training programme being started which had involved the arranging of courses.

Since the scheme had begun, about 1,000 employees had attended residential courses at the Board's training centre at Bournemouth and about 3,000 others had been on shorter non-residential courses.

The success of the scheme had been largely due to the help given by the well-organised hoteliers in Bournemouth, who had made it possible for those attending the courses to be accommodated close by without complicated transport arrangements.

Exciting prospects

Mr. Leach affirmed that the gas industry held out a most interesting future and in the 32 years of his career in the industry he had never known of more exciting prospects. He paid tribute to the work done by many in the section in providing the high standard of papers read during the past session.

Most of the work was done in the authors' spare time snatched from an already well-filled professional life. The Board, in entertaining members and their ladies, owed much to the wives who so patiently allowed their husbands to devote so much of their time at home to furthering the achievements of the Section.

Mr. J. C. Hogg, Chairman of the Section, thanked the Board for its hospitality. He gave a special welcome to Miss Jessie Frith, Secretary of the Women's Gas Federation.

Members and their ladies had driven by coach to Poole and after inspecting the Pitwines gasworks, had embarked for a cruise to the Old Harry Rocks and back to Bournemouth.

In the afternoon there was a short motor tour to Christchurch and beyond towards the New Forest. After tea those returning to London, boarded the 'Bournemouth Belle'

NEWS OF U.S.S.R. GASIFICATION PLANS

IN Uzbekistan, the construction of the first section of the Angren underground coal gasification station, with a total annual capacity of nearly 81,200 mill. cu.ft. of gas is nearing completion, and will be the biggest enterprise of its kind in the world.

Soviet specialists have recommended the commercial application of coal gasification now that its laboratory stage and semi-commercial stage have been completed, said Pyotr Skafa, Chief Engineer, at the U.S.S.R. Council of Ministers' underground coal gasification administration, in an interview with a *Tass* correspondent.

Six underground coal gasification stations are being built or enlarged in various parts of the country. During the first three months of this year, underground coal gasification enterprises have already yielded a considerable income and have cut production costs by nearly 17% as compared to last year.

WANTED!
Enterprising papers, more theory

THE lack of enterprise among younger members in submitting contributions for the short paper meeting was not only disappointing, but showed a general apathy towards their own education, said Mr. R. S. Longhurst, retiring President of the Northern Junior Gas Association, at the annual general meeting in Carlisle.

He had given considerable thought to this reluctance in an endeavour to find possible explanations. The changed pattern of the gas industry under nationalisation had had its effect and there was also an apparent refusal to consider the use of a more theoretical discourse of general interest to the industry.

The junior technician of today was more involved in a larger unit where he could easily tend to specialise too early, become a small cog in a large machine or become just another number.

Integration and the development of large manufacturing stations and distribution centres had only been achieved by the development engineer and specialists at group level or at head office, and to some degree, as far as the local junior was concerned, by remote control.

Limited field

Under the old system of smaller autonomous units, during any development on the works or district almost invariably the whole of the technical staff were involved to some degree, or at least had some interest in the scheme.

Today, the junior had to be content with a limited field of work and had far less opportunity to gain experience of several works, as movement in the industry was much more limited.

Mr. Longhurst said he was not in any way condemning the modern trend of large-scale planning and integration by experts in the various fields. This was essential for the well-being of the industry. He was only endeavouring to account for the lack of papers presented by members, but he wondered if training education was suffering from this system which had been, of necessity, adopted.

He felt it could very easily suffer, but was quite sure that greater interest in the Association could play some small part in filling in the gaps.

The following officers were nominated by the Council:

President, Mr. H. Waiton; Senior Vice-President, Mr. G. E. Haddon; Junior Vice-President, Mr. L. Nelson; Secretary, Mr. R. Proud; Treasurer, Mr. C. Ling; Transactions and Publicity Secretary, Mr. R. J. K. Shepherd; Members of Council, Mr. W. O. Kirkwood, Mr. J. R. Matthew, Mr. J. T. Lewis, Mr. Cummings; Northern District Education Committee, Mr. A. Ruddock, Mr. Nelson, Mr. E. Sheldon; Auditors, Mr. A. O. Old; Mr. H. E. Banks.

EASTERN SECTION ANNUAL GENERAL MEETING, LOWESTOFT

Service-laying must be co-ordinated

INCREASING emphasis upon the lowering of estate development costs has meant that the width of verges and footpaths has been reduced to a minimum. Only a carefully-agreed combined services layout—with strict adherence to positions and depths permits all services to be laid under them.

Mr. S. E. Balsom, Distribution Engineer of the Northern Section of the Watford Division, E.G.B., said this in his Chairman's Address to the ninth A.G.M. and conference of the Eastern Section in Lowestoft on June 15 and 16.

Most developing authorities, went on Mr. Balsom, now realised the value of the most careful liaison and planning to produce a combined services layout that would prevent overcrowding. Many had carried the planning a stage further, carefully operating a time schedule; the aim was partly to avoid congestion on site, but there were even more important technical reasons.

He said: 'With the various services laid at shorter centres the whole of a path or verge is virtually excavated to varying depths and replaced before all the services are installed.

'Even where conscientious backfilling of these trenches is carried out it becomes impossible to cut a further clean trench adjacent to the first within a short period of time. The results of bad time-phasing are apparent far too often, with scenes resembling a rather poorly conducted battle accepted as inevitable.'

Time-phasing

From the viewpoint of a layman it was certain that some estates developed with greater ease and lack of disorder where the time-phasing followed this pattern:

(1) Drainage and road works completed to final surface level for concrete roads.

(2) Water mains laid immediately road kerbs are established. Where dual water and gas mainlaying is adopted, gas mains are also laid.

(3) With the services strip reserved and protected against the storage of building materials, building commences. Part gas services are laid to the house rafts at this stage.

(4) As the brickwork is completed, or when roof construction is well advanced, gas mains are laid, followed by electricity mains and G.P.O. ducts or cables. At this stage the water main trench has been substantially consolidated by weathering and the gas main trench, normally adjacent, can be cleanly cut and consolidated and marker posts, syphon and valve covers stand a reasonable chance of survival without damage.

(5) Services are connected to the main and house access footpaths constructed.

Mr. Balsom continued: 'As with most ideals, this time-phasing schedule is rarely encountered. If stages one and two are completed to schedule, the authority will probably have found it desirable to commence building operations at a point on the estate farthest away from the entry point of the main. The building contract may be split among a number of contractors, each with differing capacities for speedy completion of buildings included in his contract.

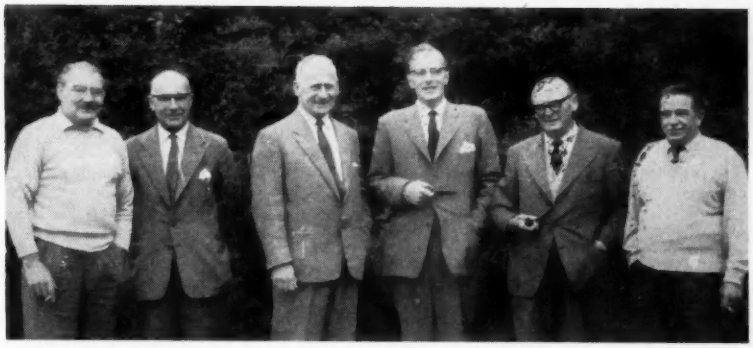
'Other major and minor difficulties can upset the smooth operation of the best planned schedule.

'Nevertheless, it seems reasonable to suppose that the closer one gets to perfecting the time-phasing, and the less real apparent disorder there is on the site, the greater will be the avoidance of wasted time, effort and money. The methods of approach by building contractors to a building contract can vary quite widely, and I have found that possibly the most important clause to ourselves in any developer's contract with the builders, is the clause which reserves the services strip free of all obstruction during the contract.'

On the question of nuisance, Mr. Balsom said that the effect of a gas distribution department upon the man in the street could often be intensely irritating.

'Our electrical supply colleagues have a pronounced natural advantage over the gas industry in the rate of progress which can be maintained in laying mains with a minimum of labour and equipment. We, with our heavy pipes, which in turn require heavy handling equipment, must of necessity show up rather poorly in built-up areas. Perhaps we have not yet reached the ultimate in materials which are light in weight, highly resistant to corrosion and of adequate strength to withstand internal pressures and external forces.

'Meanwhile, we must do all we can to see that all work in the public highway, mainlaying, servicelaying and relaying work, is carried out as safely, cleanly and as speedily as possible. Normally such conditions also lead to the most economical results. The search for new techniques and improved tools and plant continues, and we may yet see pronounced material and plant changes in distribution work.'



Golf at the Lowestoft meeting. Left to right are: Mr. W. Morland Fox, Mr. B. Pollard, Mr. D. D. Melvin (President of the Institution), Mr. S. E. Balsom (Chairman of the Eastern Section), Mr. J. Hunter-Rioch (Secretary and Treasurer), and Mr. C. T. Battersby.

I.G.E. President's first Section meeting

APART from brilliant weather and an interesting (and not too strenuous) programme of business, the occasion can be flagged as the first District Section meeting attended by the new President, I.G.E., Mr. Duncan Melvin.

Golf and bowls competitions were held on the Monday morning; in the afternoon at the Annual General Meeting Mr. Balsom presented his Address.

For the year 1959-60 Mr. R. J. Gavin (Royston) was elected Chairman, Mr. E. H. Winch (Cambridge) Senior Vice-Chairman; and Mr. K. B. Meggitt (Bedford) Junior Vice-Chairman. Mr. J. Hunter-Rioch, M.B.E., carries on the duties of Hon. Secretary and Treasurer.

At the business session on Tuesday morning, Messrs. K. C. Rees and J. F. Smith presented 'Practical Consideration of Complete Gasification, Watford'—a most interesting account of trials and tribulation, patient endeavour and approaching success. A lively discussion ensued, and a commentary is given in our Editorial Comment columns.

For the Monday night the Mayor of Lowestoft invited the conference to a reception and dance, and Tuesday's proceedings terminated with the customary—and most enjoyable—Section Luncheon.

Company news

Fuel policy hits conventional plant making

IN his remarks accompanying the 1958 accounts of Drakes Ltd., Mr. John A. Drake, Chairman and Managing Director, says that, as in 1957, the year had been an exceedingly difficult one for trading in the gas industry, there again being no large orders placed for the building of traditional gas-making plant.

'I feel that the Government cannot continue to allow large scale conversion to oil in all industries when there is so much unsold coal available,' he said.

Useful contacts

The management were seeking every opportunity of obtaining orders outside the gas industry, and during the year many useful contacts had been made and small orders obtained for other types of work. But the market was very competitive.

Dividend on ordinary shares is maintained at 5%. Group net profit was £9,367. Carried forward by Drakes Ltd. is £50,073.

Lancashire Dynamo

Lancashire Dynamo Holdings Ltd. recommend a final dividend of 7% on the ordinary stock, less income tax, making a total of 11%, less income tax, for the year ended December 31, 1958. In addition the board recommend a special bonus interim dividend for 1959 of 1½% payable at the same time as the final dividend. The net profit of the group for the year before taxation amounts to £836,466 (1957—£746,565) less tax of £446,124. Taxation provisions no longer required are £6,454, leaving a balance available for appropriation of £396,796, less £33,926 retained in subsidiary companies.

The Board also propose to recommend to the shareholders the issue of 726,317 ordinary shares of £1 each, fully paid, by way of capitalisation of reserves on the basis of one new ordinary share for each £3 ordinary stock held.

SIMON-CARVES

THE group profit before taxation of Simon-Carves Ltd., for the year ended December 31 last was £1,461,814. Taxation thereon was £740,142 and taxation adjustment in respect of prior years was £30,171. Minority interests accounted for £5,200, with profit attributable to members of the company at £686,301. Dividends, 10% interim already paid and 15% proposed, amounted to £224,063. Pre-acquisition profits were £25,853 and appropriations to revenue reserves totalled £103,884. Unappropriated balance for the year carried forward came to £332,501.

International pipe-line standards

THE Council of the International Gas Union have arranged to prepare a model set of safety standards for international gas pipe-lines and to study preventive measures against gas poisoning in homes.

Meeting in Oslo, the Council was under the chairmanship of Mr. B. M. Nilsson, President of the International Gas Union, with Mr. R. H. Touwaide, the General Secretary, in attendance.

Also present were delegates from the national gas associations of Belgium, Britain, Denmark, West Germany, France, Italy, Netherlands, Norway, Rumania, Sweden, Switzerland, and Russia.

The two safety aspects were among arrangements made at the meeting to carry out missions entrusted to it by the Gas Working Party of the Economic Commission for Europe.

The Council also placed into the hands of groups of experts the duty of studying the interchangeability of gases of high calorific value, and their production.

Views were exchanged on the technical questions to be studied for the 1961 conference. Subjects retained were provisionally divided among member associations.

Among members attending the meeting for the first time was Dr. J. Burns, past-president of the Institution of Gas Engineers.

GOOD YEAR FOR CAPE ASBESTOS

TURNOVER of the Cape Asbestos group increased 8% in 1958 states Mr. Giles Newton, Chairman of the Cape Asbestos Co., Ltd., in the group's annual report published recently.

Sales of the parent company's products increased, with a marked improvement in marine business, but profit margins tended to decline. Export sales accounted for 17% of the parent company's turnover. Agreement had been reached with two well-established firms in Argentina and with the Johns-Manville Corporation to manufacture asbestos products in that country.

The amount of crude asbestos sold in South Africa had been slightly greater in spite of Russian competition. The peak of capital development in the South African mines had been passed. Expenditure in 1958 had been less than in 1957 and would be less again in 1959.

The group's net profits after all charges, including taxation, was £754,266 compared with £716,572 in 1957.

RECORD MAKE AT NEW ZEALAND WORKS

NEW record daily make and output figures were achieved last year at the works of the Wellington (New Zealand) Gas Co., Ltd., with a make of 5,581,000 cu. ft. and an output of 5,333,000 cu. ft.—an all-time record. This was stated by Sir Charles Norwood, Chairman of the company, at the 89th annual general meeting recently.

He went on to say: 'Revenue amounted to £770,545, an increase of £56,348 compared with the record year of 1957.

'It is pleasing to report that our dividend of 6% is still maintained and that after payment of this dividend, we are carrying forward a surplus of £2,210 to increase the amount of unappropriated funds to £64,514.'

Sir Charles said that the capital expenditure for the year amounted to £65,474. The reconstruction and modernisation of the No. 1 and 2 Glover-West retort houses has proceeded during the year. In addition to this work, a good deal of repairs and maintenance was carried out on the works and also within the district.

He went on: 'With the passing of the gas industry Act at the last session of Parliament, the scheme of local mergers of gas and electricity undertakings has now been abandoned and therefore no further negotiations were necessary for the sale of the undertaking to the Wellington City Council.

Ireland

BANGOR PROFIT RISES SHARPLY

Bangor (Co. Down) Borough Council's gas undertaking made a net profit last year of £5,541, an increase of £1,072 over the previous year.

Sales of gas increased by £969, and coke by £1,604. Work had commenced on the £90,000 contract for the reconstruction of the plant which was installed in 1922.

Submitting the figures to the Borough Council, Alderman F. Logan, chairman of the Gas Committee, described the year just ended as one of achievement and enterprise. Trading profits had increased, he said, and a new coke-grading and screening plant had been erected at a cost of £13,000. Sales of appliances amounted to £17,795.

During the financial year ended March 31 the total gas sold in **Coleraine** showed an increase of 8,217,000 cu.ft., which was equivalent to 6%. The amount of gas manufactured during the same period showed a decrease of 4%.

Gas charges may be increased within the next year—depending largely upon the kind of weather experienced in the coming winter, says Mr. J. L. Haslop, **Belfast** Gas Manager, in his annual report to the Gas Committee of Belfast Corporation, presented recently.

From the Chairman's address to the London and Southern Section of the I.G.E., presented in London, May 19, 1959

Measurement for Control

By J. C. HOGG, M.Inst.Gas E., M.Inst.F.,

PRODUCTION ENGINEER, DORSET AND BOURNEMOUTH REGION, SOUTHERN GAS BOARD.

IN the installation of new plant the need for measurement is obvious. There is, though, a need to ensure that its extent and layout are planned at the earliest possible stage. It is at this stage, too, that not only the question 'What do we require to measure?' should be considered, but also 'What might we require to measure?' The provision of means of installing measuring units at a future date can avoid the cost of an instrument until it is required. Without that provision subsequent measurement becomes makeshift and expensive.

Not the least interesting feature of a new plant or process is the information which it can provide. Information is generally required in greater detail than is at first envisaged. This information may provide the spring in the Boards' next project.

New processes provide an ideal opportunity for the co-ordination of instruments for control purposes. The trend towards fully-automatic plant control and highly-automatic process control is an accepted fact. The practical aspects and implications have been clearly described. Are we, as an industry, preparing ourselves to take advantage of its possibilities and deal with its problems? There is an urgent educational need at many levels to adapt ourselves to this prospect.

Existing plant, while not having the advantage of a clean start in the latest field of control methods, has naturally progressed with the steadily increasing knowledge over the years, and there are many examples of completely instrumented plant.

So far there has not been a swing to automatic control. While cyclic water gas plants have been automatically-controlled with cams and levers for years—long before automation was thought of—it has been strictly on a constant time basis rather than on information fed back from the plant itself. Carbonising and subsequent purification plant have been controlled on a volume per hour basis, plant conditions being manually adjusted or re-set after the assessment of the information derived from various measuring instruments. Exceptions to this are, for example, the automatic control of calorific value; flow and temperature conditions on distillation plant in which feedback is derived from one or more plant variables. Control of wet or dry purification or benzole recovery has not been made automatic in the modern sense. The reason lies not in the practical control problems, but in the problems of measuring the necessary plant conditions. Of necessity, plant has been tuned to average conditions, on an hourly or daily basis.

If existing processes are to be tuned to peak efficiencies, practical experience (which is still a *sine qua non* for good control) must be backed by sound measurement, not the least to prevent the insidious drift which can so easily occur when a large number of plant variables are involved.

Before referring to some examples it seems appropriate to mention two broad achievements which have, in recent years, influenced the design of instruments and control devices:

(1) The development of reliable means of amplifying the measured signal, which no longer has to rely solely on energy derived from the material being measured.

(2) The introduction of force balance principles whereby an external force, either from electrical, hydraulic or pneumatic energy is used to balance a force resulting from a measuring element.

In both cases the hugely increased forces available have provided means of linking the measuring element to control mechanism. The reduction in mechanical linkages, time lags and friction has enabled far more robust yet sensitive designs to be developed, guided by increasing appreciation of control theory.

In applying the external energy such factors as proportional, integral, derivative control can be incorporated as well as other corrective factors to offset inertia, backlash, variable friction and, of particular interest to us, correction for pressure and temperature.

The amplification of minute direct current signals has followed various patterns, generally thermionically but more recently by means of transistor d.c. amplifiers. Mark well this little device, with its unforgettable relationship with the gas industry in the use of germanium from our flue dust. Just ten years ago the invention of the transistor was announced in the United States. Today 3 mill. a month are being produced. In this country the development has been slower, but is fast catching up. The impact on industry generally has hardly yet been felt. It is likely to be enormous.

Today there appears to be no scientific limit to the extent to which measuring elements can be effectively coupled to automatic control arrangements, provided that the units have a 'fitness of purpose.' This brings the matter into the field of conventional engineering. It is a factor which determines the operational (or prac-

tical) accuracy as compared with the intrinsic accuracy of the instrument.

The measuring element usually suffers most from such enemies as dust, dampness, fumes, corrosion. Preventive maintenance can combat these, but the initial choice of two alternatives has generally to be made:

(1) To "ruggedise,' by design and materials, the measuring element in order to withstand prevailing conditions, and then transmit the signal to an instrument in more satisfactory surroundings.

(2) Bring the substance to be measured into suitable surroundings by remote sampling.

1. *Ruggedise.* The word is no doubt imported, but it does give a fair impression of something built to withstand arduous conditions. Nowadays there are some excellent examples of this, but there is much which can be done in the way of inert finishes and partial or full encapsulation, if we are willing to pay for it.

If confidence is to remain in a device its sound appearance must be maintained. One recalls (no doubt on the other man's works) the once-shiny brass dial gauges, partially rain-filled, which perhaps jut out at curious angles from pipe-lines; the recording pen which drips its ink on to delicate mechanism; the layer of grit which gathers on the working parts via a poorly designed instrument case door; the growth of corrosion on exposed metal. This is not to disparage the instruments, which have done, and are doing, splendid service. That these types of fault are steadily disappearing is not only a matter of design but of outlook, which today seeks standards of plant conditions comparable with any other industry. The individual rectification of these little faults may not save us a penny, but the absence of the wish to do so may indeed be costly.

Operational accuracy is closely associated with such things, in addition to the more acceptable effects of fair wear and tear.

Automatic Control

Experience of poor operational accuracy may well prompt engineers to seek intrinsic accuracy far higher than particular control conditions justify—an expensive and uncertain form of insurance. On the other hand, joint approach by makers and users might well modify thoughts on instrument obsolescence.

2. *Remote sampling.* The advantage of having the majority of control and instrumentation equipment installed in an air-conditioned room is a feature of modern control systems, and telemetering of almost all the usual parameters has become possible.

Much of our works plant, however, will for many years to come have to be operated as individual units and controlled as such. The need for some exposed instruments will continue. On the other hand, the increasing number of gas streams from different sources, together with higher standards of quality demanded, justify the practice of continuous measurement being carried out at one convenient point on the works. The remote sampling for continuous measurement of quality has always been something of a problem. There is a need for some standardisation of approach in the installation of sampling equipment and pipe-work. Various methods and materials are in use.

At Poole the use of $\frac{1}{4}$-in. i.d. Birmabright aluminium pipes is giving interesting results. The small pipe diameter reduced the time lag and the cost. Some 3,000 ft. of piping, with couplings of similar material, have been installed, linking six gas streams to the test room. The pipe-lines vary from 100 to 750 ft. in length and are run above ground. In all but the longest pipe runs there is sufficient pressure for adequate continuous sampling. On the longest runs small Tufnol bladed positive blowers driven slowly from fractional h.p. motors provide boosted pressure. A reliable sampling pump does not seem to be available and would be a useful piece of standard equipment. The pumps referred to were converted from small rotary air compressors by fitting glands, Tufnol blades and geared motor drives.

The samples are fed to recorders of calorific value, specific gravity, oxygen, dewpoint, and to 8 GLC units for H_2S measurement in conjunction with an EEL meter.

The recording calorimeter and gravitometer are of conventional Sigma types. The official Fairweather recorder is also in the adjoining room.

The oxygen recorder is a Kent paramagnetic type (0-3%), having a divided chart and two measuring elements. These 'scan' the six streams by drawing in samples via a separate time-switched arrangement of solenoid valves, each stream being sampled for 20 minutes in the hour. Response is rapid and no difficulty with 'dead' gas has been encountered.

Design Development

A Foxboro-Yoxall Dewcel recorder is recording dewpoints very satisfactorily, and has shown interesting variations which can be related to the dri-gas plant conditions. The humidity-sensitive Dewcel is basically a thermometer bulb inside a metal tube covered with a woven glass tape impregnated with a hygroscopic salt. Wound over the tape are two parallel gold wires connected to 25 volts a.c. When the salt absorbs moisture from the surrounding gas it passes a current between the parallel wires, raising the temperature of the cell until equilibrium is reached. The final temperature is measured by a thermometer and records the dewpoint. A proportional and reset controller can be fitted to operate a control valve. Mention should be made of the Sigma Wobbe Index recorder which appeared in 1955.

The future possibilities for rapid quality measurement which lie in the use of infra-red, ultra-violet and mass spectrometric methods, are already appearing and emphasise the tendency for mechanics, electronics, and optics, to be blended in the modern approach to instrumentation. It is not yet clear which of these techniques will fulfil the need for the measurement of odour! Other gas quality measurements lie more in the field of chemical analysis, which is outside the scope of this address, and their organisation has been recently described to the Section.

It is an interesting fact that although in principle weighing has been one of the most accurate forms of measurement for centuries, the industry still encounters practical difficulties in weighing raw materials and our main solid end product, and the accuracy is often found to be low. While grease and rags are weighed out with meticulous care, many thousands of pounds' worth of materials are fed into processes with only the broadest check on their weight. Again the difficulty of

More advantages

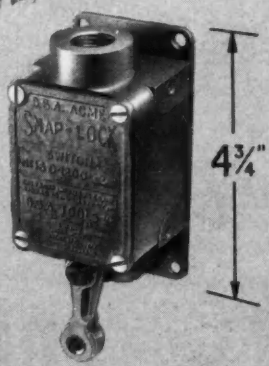
A TYPE APPLICABLE TO EVERY INDUSTRY

in Mark II SNAP-LOCK heavy duty limit switches

WATER
OIL
AND
DUSTPROOF
OR
FLAMEPROOF
VERSIONS

Now **TWO ONLY REPLACEABLE UNITS IN THE ELECTRICAL SIDE**

There are only two assemblies in the electrical side of B.S.A. ACME SNAP-LOCK Mk. II limit switches: a moulded one-piece contact block and the contact arm. Interchangeable on all models they are designed for easy replacement. Service kits comprising these items, complete with holding nut and fixing screws, are supplied at moderate cost.

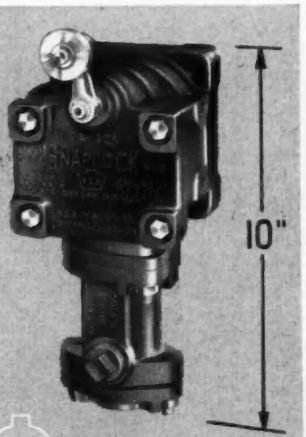


STANDARD

WATER, OIL & DUST PROOF

Single pole, double break, double throw, operates with either circuit normally open with other closed, or maintaining in either position, or available with central (neutral) position and/or centre connection. Heavy aluminium die-cast case. Water, oil and dust proof. Conduit ¾ in. B.S., or No. 3 Admiralty Pattern Cable gland entry. Two-screw side mounting or backplate mounting in two styles, or Tandem style (back to back mounting). Operating lever position adjustable in 7.5 deg. increments through 82.5 deg. either way from normal.

STANDARD NEUTRAL POSITION OR CENTRE CONNECTION

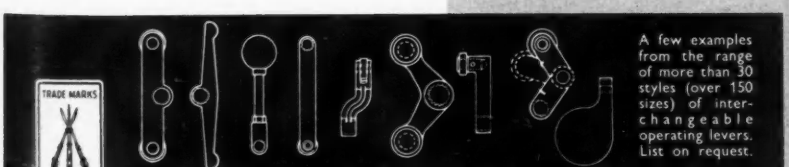


FLP FLAMEPROOF

SINGLE OR DOUBLE ENTRY

Buxton certificates No. 3574 (Group I) No. 3575 (Groups II and III gases). Meehanite iron castings. Self wiping solid silver contacts, interchangeable plugs and sockets. Internal mechanism removable as a unit for servicing. **Single SWA cable entry (standard); double entry if required.** *Operating lever position adjustable in 7.5 deg. increments through 360 degs. Single pole, double break, having one normally closed and one normally open circuit. Available with central (Neutral) position and/or centre connection.*

B.S.A. Acme Snap-Lock heavy duty limit switches have an established reputation for reliability under the most arduous conditions. Recently introduced Mark II versions retain proved features of their forerunners but incorporate refinements in design and manufacture principally to simplify servicing, provide complete interchangeability of assemblies, increase electrical resistance to earth and ensure lasting efficient sealing. Please ask for the Mark II catalogue.



A few examples from the range of more than 30 styles (over 150 sizes) of interchangeable operating levers. List on request.

TRADE MARKS
B.S.A. TOOLS DIVISION

Made in England under Licence by B.S.A. TOOLS LIMITED, BIRMINGHAM 33

Sole Agents U.K.

BURTON GRIFFITHS & COMPANY LIMITED
SNAP-LOCK DIVISION, 93 ALBERT EMBANKMENT, LONDON, S.E.11
PHONE RELiance 3891

B.S.A. SNAP-LOCK ACME

463

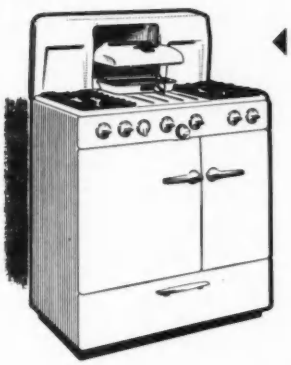
NEW WORLD
brings
new business

NEW WORLD means

GREAT
PRICE REDUCTIONS
trigger off
that
buying urge

Top cooker value

. . . and we've made sure all your customers know it!



NEW WORLD RANGETTE

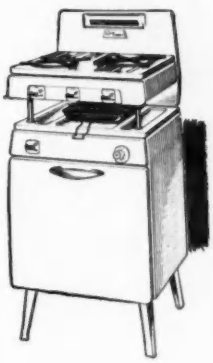
Reduced by OVER £8

Now only £55

NEW WORLD CADET

Now with automatic hotplate ignition

Only £22.10.6

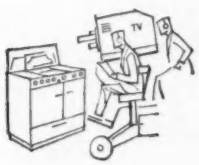


PUNCH-PACKED, HEAVYWEIGHT PUBLICITY

We've *shouted* about NEW WORLD price-cuts. 30-second T.V. commercials at peak hours on all stations! Big spaces in mass circulation papers! Thousands of door-to-door canvassers' leaflets!

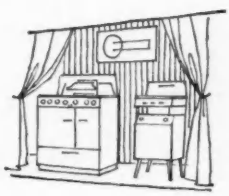
We've lit a gleam of desire in customers' eyes. Made fingers itch to reach for purses and cheque books. *Your* customers are interested. Eager. Ready to buy. And buy they will — with just a word of persuasion from you!

TIE-IN WITH POINT-OF-SALE . . . AND CASH-IN WITH SALE AFTER SALE



Now they can *really* work for you. Keep them on view. Constant reminders to people already sold on NEW WORLD value that *your* Showroom is the place to stop—*look*—BUY!

BOLD WINDOW STICKERS AND ATTRACTIVE COOKER DISPLAYS



NEW WORLD

PRODUCT OF Radiation Ltd.

leads the way in building turnover

RADIATION GROUP SALES LTD., 255 NORTH CIRCULAR ROAD, LONDON, N.W.10. Willesden 1234

DEFEAT ABRASION

ARMADILLO CHUTE LINING
A
B
A. Thick tyre-tread stock of extreme thickness resists abrasion, corrosion and impact.
B. Fabric backing of one or two plies available.

with super-tough new ARMADILLO Chute Lining

HERE'S A LINING material that will even outlast heavy gauge st Goodyear Armadillo Chute Lining. Built from tough rubber c pounds, which may be backed by fabric, it resists crushing, abra acids, corrosion and heat. Its uses are limitless – it gives longer li chutes handling abrasive materials, is used as lagging for dri drums, protects the insides of truck bodies, guards the wall shot-blast chambers against wear. Available in a wide range of s sizes and thicknesses, it can be easily fabricated. Armadillo C Lining has important applications in **your** industry. Ask for de from The Goodyear Tyre & Rubber Company (G.B.) Lim Industrial Rubber Products Department, Wolverhampton.

GOODYEAR

INDUSTRIAL RUBBER PRODUCTS

CONVEYOR BELTING · V-BELTS · TRANSMISSION BELTING · HO

economical measurement is the main reason for this, particularly in conjunction with varying moisture contents. Conventional weigh-bridges, properly maintained have, of course, reached a high degree of accuracy, but within our processes continuous forms of weighing are needed. It is here that the difference between 'intrinsic' and 'practical' accuracy is particularly noticeable. Continuous or batch weighing devices operating in arduous conditions are very susceptible to errors. Ten years ago it was unusual to find such equipment operating very reliably. Today regular maintenance has greatly improved the position. In recent years the development of the load cell has brought new possibilities to this problem.

In principle the weight to be measured imposes a strain—well below the elastic limit—in a billet of steel. This strain is measured by strain gauges attached to the billet. The movement produced may only be a few thousandths of an inch. The cells may therefore be built into moving structures, cranes, telphers, etc. The signal produced can be transmitted to a convenient position to indicate or control the weights. The robustness and absence of moving parts in the element is attractive.

Interest in accurate, high speed automatic bag weighing of coke has led to the development of new machines for this purpose, for example the Avery 4921 weigher. In this case a conventional steelyard principle is used, in conjunction with motor-controlled regulating gates.

Air Conditioned

Mixed methods of gas manufacture, the transfer of gas between undertakings and the growth of long distance distribution systems have all focussed attention on methods of gas flow measurement. Much thought in appropriate committees is being given to the subject. A considerable amount of work has been carried out over the years on the conventional venturi and orifice plate elements. Their limitations due to their pressure loss, susceptibility to changes in Reynolds numbers, pulsation and flow profiles, are for many applications not serious, but these are becoming more significant both for quantity measurements and for control work. The improvement in the performance of the differential pressure instruments associated with these elements has considerably off-set their limitation, but one hopes now for a break-through to other methods of detection, particularly for the crude or partially purified gas streams which could give information for the better control of individual plants in the stream.

The importance attached to steam measurements is reflected in the steam surveys which N.I.F.E.S. have been requested to carry out in the gas industry. In the measurement of steam flow the orifice plate has proved to be an inexpensive element but, as with gas flows, considerable care and experience is needed to use it correctly. The integration of steam consumption on cyclic plants is most difficult, particularly if varying dryness or pressure is encountered. A different approach to the problem is the new continuous linear flow integrator (Foxboro) which operates on 3-15 p.s.i. air signals from a differential pressure transmitter and orifice plate. The signal in the form of air pressure is force balanced against centrifugal force produced by a small air turbine wheel.

A new method of flow measurement of conducting liquids is the magnetic flow meter. This operates on the long-known principle of movement in a magnetic field, a typical case of a detecting principle which has had to await better amplification systems. The attractions of this principle are, first, that the signal generated is direct, linear and proportional to the average velocity of the material in the pipe, independent of viscosity, density, turbulence, or suspended matter. Secondly, there are no sudden restrictions in the flow line. Although this meter's present use is primarily for 'difficult' fluids—slurries, etc.—it would seem to have wider possibilities in the future.

What progress has there been in the means of measurement for the control of manpower? In this respect measurement is still exceedingly uncertain, and in applying the science we are in danger of losing the art. There are as many yardsticks as there are individuals, and each can itself vary as a standard. One finds, even in small groups of people, there is a latent increment of effort which emerges or is submerged according to prevailing conditions. It is important that some assessment of the conditions should be made if effective control is to follow. What, for example, is the measured ratio of constructive attitudes to destructive (disinterest, dismay, discomfort, etc.) attitudes in a group of people at a given time? How much surer control would be if such figures could appear as impartially and as regularly as, say, a Wobbe index. Assessment becomes more difficult as, owing to increased distance or preoccupation, contact with the group reduces. In a period of major industrial re-organisation, when our minds are busy with urgent material matters, the problem is a very real one.

In our efforts to make and study machines that control and machines that think, there is found a growing recognition of similarity between these mechanisms and at least some aspects of the human equivalent, including the essential need for the accurate transmission of the measured values. Effects due to over or under sensitive feedback, instability, etc., are also similar. In the case of manpower, looped as it is in very complex systems of feed forward and feedback, our problems of measurement can be offset by rapid and accurate transmission, i.e., by good communications.

Future Possibilities

Before leaving the manpower question there is a form of measurement which deals largely with effort and fatigue. One can recall, and still find, plant which has all the requirements for smooth working except that there is a physical weakness—often quite small—between the point of operation and the operator, and where improvements can be made after measurement. For example, the instrument panel which, by better siting can more easily be read; the control lever which, by improved design, can better suit a man's arm or hand (on a two-minute cycle a shift-man will have operated it a million times since vesting day!), the seat in the crane or telpher cabin which, by modification can give a man (who may have spent 20,000 hours there since that date) a better view of his load. Is the control point in keeping with the effectiveness of the machine, or is there a break in the standard of the system?

These are the types of measurement which cost least.

but which can pay dividends in increased well-being and safety, smooth working and reduced maintenance.

The very mention of reduced maintenance is attractive, but efforts to reduce the need for maintenance, as well as reducing its cost, require all the experience and judgment we can muster. Preventive maintenance depends on good measurement for the selection and examination of materials, the planning of programmes and especially for the prevention of waste. It is often of value in answering the essential question 'What is the real cause of the maintenance?'

The type of detector which is gradually coming into everyday use includes the non-destructive ones, the gamma ray test for welds, vibration and crack detectors.

The use of suitable transducers for pressure measurement may prove helpful in studying pulsations and transients on the outlet of compressor system and pumps. They will respond to much higher frequencies (3,000 cycles) than conventional gauges and no inertia exists in the tracing of the pattern. There is a need for a simple mobile thickness gauge for the examination of tanks, mains, etc. Existing types are progressing towards this end.

Serenely Established

In an address such as this one is aware of the many things which have not been included, yet which themselves play vital part in measurement. Of temperature measurement in its serenely established position, which for many years provided almost the only form of automatic plant control; of the old needs in the measurement of levels, heights, bulk storage; of new needs in the tracing of dust and energy; of the 'unforgiving minute' which limits our efforts yet leads us into the future.

The future pattern of our industry has become clearer, but it is difficult to visualise the extent to which automation, which is the logical development of measurement and control, will be found. Certainly computation and a degree of 'feed forward' is to be expected on the new processes, and a higher degree of automatic control on existing plants. If this is desired it will not come without a conscious effort to obtain more and better means of continuous measurement. The reliability of measurement, which is essential to good feedback systems, must be enhanced by greater accuracy, lower time lags and, above all, by a greater knowledge of our plant characteristics before the next step forward can be taken.

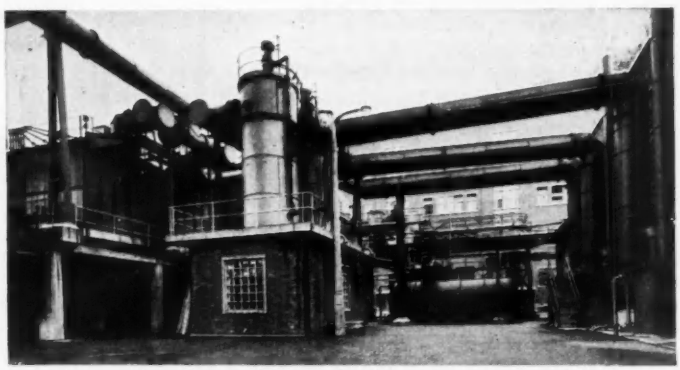
Apprenticeship Tests

SELECTION tests to try to guarantee the quality of boys engaged as engineering apprentices have been devised by the National Institute of Industrial Psychology. A report just published states that tests introduced by a number of firms towards the end of the war show a relation between selection-test performance and later successes at technical college and in City and Guilds or National Certificate examinations.

Copies of the report, with statistical tables, can be obtained from the National Institute of Industrial Psychology, 14, Welbeck Street, London, W.1. (Price 5s. Postage 4d.)

CONTRACTORS TO THE GAS INDUSTRY FOR OVER 100 YEARS

SPECIALISTS IN ALL TYPES OF GASWORKS PLANT



The riveted steel mains shown in the illustration were erected by us at Bromley-by-Bow Gasworks.

Photograph by courtesy of the North Thames Gas Board.

SAML. CUTLER & SONS LTD.

70 VICTORIA STREET
WESTMINSTER, S.W.1

PROVIDENCE IRON WORKS
MILLWALL, E.14